

ABSTRACT

An inductor with self-damping properties for use in multiple applications including for high power broadband frequency applications is provided by a coil having an input end and an output end and wound about a core of magnetically permeable material and an eddy current generator incorporated either at the time of manufacture or post manufacturing. The core can be air (e.g., a hollow coil of wire). Alternative core materials are iron, iron powder, steel laminations and other appropriate materials. The core may be incorporated into some form of frame whether I shaped, U shaped, E shaped or of an encapsulated shape arrangement. The inductor's Q value may be changed selectively by deliberately inducing eddy currents in preferred locations. The eddy currents are induced into the inductors and have the effect of introducing a back EMF which is designed and scaled appropriately to adjust the Q value at the desired frequency resulting in less phase distortion. When phase "distortion" is minimized, waveform is necessarily well preserved. The listener then observes improved clarity, identity, vitality and intelligibility. The phase angle within the response band depends on the roll-off or roll-up slope, be it a 1st, 2nd or 3rd order. One self damped inductor includes an iron double "E" core inductor carrying a primary coil of insulated copper wire wound around an iron core. Core is formed by the central leg of an "E" frame pair and carries an eddy current generating winding implemented by winding an electrically conductive insulated and isolated secondary coil around the outside of the primary winding. An electrical connection is established between the two ends of the secondary coil. The secondary coil preferably comprises a single turn of wire but may consist of a thicker gauge wire or of multiple turns if it is desirable to increase the magnitude of the eddy currents generated.